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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,639	04/07/2004	Judith Manco	PES-0102	8483

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EXAMINER

HAILEY, PATRICIA L

ART UNIT	PAPER NUMBER
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1755

DATE MAILED: 04/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/820,639	Applicant(s) MANCO ET AL.	
	Examiner Patricia L. Hailey	Art Unit 1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-10 and 22-31 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-6, 10, 28 and 29 is/are allowed.
- 6) ☒ Claim(s) 7-9, 22-27, 30 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Applicants' remarks and amendments, filed on January 17, 2006, have been carefully considered. Claims 1 and 11-21 (drawn to a non-elected invention) have been canceled; new claims 22-31 have been added.

Claims 2-10 and 22-31 are now pending in this application.

Withdrawn Objections and Rejections

The objection to claims 6 and 7 for the informalities therein have been withdrawn in view of Applicants' amendments to these claims.

The 112(2) rejection of claim 8 stated in the previous Office Action has been withdrawn in view of Applicants' amendment to this claim.

The 102(b) rejection of claims 1-10 as being anticipated by Hitomi et al. (U. S. Patent No. 6,492,295) stated in the previous Office Action has been withdrawn in view of Applicants' amendments to the claims, and in view of Applicants' persuasive arguments traversing this rejection.

The 102(b) rejection of claims 1-3, 7, 8, and 10 as being anticipated by Uchida et al. (U. S. Patent Application Publication No.2002/0182478) stated in the previous Office Action has been withdrawn in view of Applicants' amendments to the claims, and in view of Applicants' persuasive arguments traversing this rejection.

New Ground of Rejection

The following New Ground of Rejection is being made in view of Applicants' amendments, and in view of the Examiner's discovery of the reference to Kohler et al. (U. S. Patent No. 6,844,286), as a result of Applicants' amendments.

Claim Rejections - 35 USC § 112

1. *Claims 24, 26, 27, and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.*

These claims are indefinite for lacking antecedent basis for the limitation "electrode" and the properties/characteristics describing the "electrode". Claims 5 and 8, from which these claims depend, are directed to method for making an *electrode decal*.

Additionally, it cannot be determined whether the limitations recited in these claims refer to the electrode layer formed as a result of drying the catalyst ink deposited on the decal (i.e., the "electrode layer"), or to the resultant electrode decal (electrode layer plus decal).

For examination purposes, the limitations of claims 24, 26, 27, and 29 will be interpreted as referring to the "electrode layer" (i.e., the dried catalyst ink).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. *Claims 7, 8, 22-25, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Kohler et al. (U. S. Patent No. 6,844,286).*

Kohler et al. teach the manufacture of catalyst-coated substrates comprising a hydrophobic surface (considered equivalent to “decal”) and a catalyst layer deposited thereon, said method comprising the steps of coating said surface with a catalyst ink, followed by drying, wherein the catalyst ink comprises an electrocatalyst, an ionomer, a solvent, and a surfactant. See col. 4, lines 36-46 of Kohler et al. (considered to read upon claims 7 and 8).

Examples of the electrocatalysts include carbon black supported precious metal based catalysts, such as Pt/C or PtRu/C. Examples of the organic solvents include esters (e.g., esters of C₁₋₄ alcohol with a C₁₋₄ carboxylic acid); exemplary ionomers are commercially available. See col. 6, lines 1-32 of Kohler et al., as well as the Example, which discloses the employment of Nafion, a well-known perfluorosulfonic acid ionomer (considered to read upon “perfluorinated sulfonyl fluoride polymer).

The exemplary catalyst ink disclosed in Kohler et al. produces cathodes and anodes exhibiting metal loadings comparable to that comparable to that recited in **claims 22 and 23**. See col. 7, lines 32-37 of Kohler et al.

Kohler et al. also disclose that electrocatalysts in which the catalytically active platinum group metals have been fixed in nano-sized particle form to the surface of a conductive support material are known to exhibit average particle sizes, for the platinum group metal, ranging between about 1 and 10 nm. See col. 2, lines 30-39 of Kohler et al.

Although Kohler et al. do not explicitly disclose the density of the catalyst ink (**claim 30**), or the lateral electrical resistance of the electrode (e.g., **claims 24 and 25**) such properties are considered inherently present in the catalyst ink disclosed in Kohler et al., since Applicants' claims 7 and 8, while reciting the components of the claimed catalyst ink, do not recite any respective percentage amounts of these components.

In view of these teachings, Kohler et al. anticipate claims 7, 8, 22-25, and 30.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. *Claim 9, 26, 27, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohler et al. (U. S. Patent No. 6,844,286), as applied to claims 7 and 8 above, in view of Mussell (U. S. Patent No. 5,702,755).*

Kohler et al. is relied upon for its teachings in the above 102(e) rejection. Although the reference discloses the formation of a catalyst layer on the hydrophobic surface of a substrate, the reference is silent with respect to the thickness of said layer (claims 26, 27, and 31) and with respect to the particle size range recited in claim 9.

Mussell teaches a composition (defined as an ink, see col. 3, lines 58 and 59 of Mussell) comprising catalytically active particles, an organic compound, and a polymeric binder, wherein said composition is applied as a layer to a solid polymer electrolyte, a carbon fiber paper, or a release substrate (in a process for preparing a membrane/electrode assembly; considered to read upon the claim limitations regarding making an electrode decal). See the Abstract of Mussell, as well as col. 1, lines 29-32.

Examples of the catalytically active particles include platinum particles supported on carbon; the size of the platinum particles is preferably at least about 10 angstroms (1 nm), but preferably no greater than about 500 angstroms (50 nm). See col. 2, lines 36-43 of Mussell (considered to read upon **claim 9**).

Exemplary organic compounds include ethylene carbonate and propylene carbonate. See col. 3, lines 19-24 of Mussell; note that these compounds are also disclosed in Kohler et al. as exemplary organic solvents (col. 6, lines 13-22; Kohler also discloses that mixtures of the disclosed organic solvents—including esters—may be employed).

Exemplary binders include polytetrafluoroethylene polymers having pendant sulfonic acid groups, such as Nafion™ (also disclosed in Kohler et al.; see col. 7, lines 10-24). See col. 3, lines 44-51 of Mussell.

The ink, after application to a solid polymer electrolyte, may be cured (to remove at least 95 percent of the organic compound), and is applied in an amount sufficient to provide a layer of the composition which, when dry and protonated, has a thickness of

at least 1 μm , and preferably no greater than about 30 μm . See col. 4, lines 27-34 of Mussell (considered to read upon claims 26, 27, and 31).

Because both Kohler et al. and Mussell teach catalyst inks comprising the same and/or comparable components, motivation to combine their teachings is deemed proper.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Kohler et al. by applying a catalyst layer having a thickness of at least 1 μm , said catalyst layer comprising catalyst particles exhibiting a particle size ranging from 1 to 50 nm, as suggested by Mussell, to provide an optimum catalytic effect under the operating conditions of an electrochemical device in which said catalytic particles are employed. See col. 2, lines 43-46 of Mussell.

Allowable Subject Matter

8. Claims 2-6, 10, 28, and 29 are allowed.
9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or suggest the catalyst ink composition recited in claim 5, comprising specified percentage amounts of a catalyst compound, a perfluorinated sulfonyl fluoride polymer, and ester, and polyvinyl alcohol.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

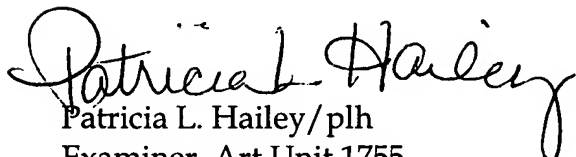
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369. The examiner can normally be reached on Mondays-Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Patricia L. Hailey/plh
Examiner, Art Unit 1755
April 4, 2006


DAVID SAMPLE
PRIMARY EXAMINER